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Authorized by: SE

Date: 4/25/13

March 29, 1981

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Carbon Copies to:

- Stan Lichtman
EPA
- AIPC, Chairman
- Governor, Laguna Pueblo
- U.S. PHS
Laguna, Acoma

Dear Sirs:

This letter is in response to solicitation by the USGS and the USBIA of public comment on issues to be addressed in the proposed draft environmental impact statement regarding the reclamation of the Jackpile-Paguate uranium stripmine. This written comment will be limited to suggestions we have on reclaiming the area in such a way as to minimize health risks to persons nearby the stripmine and limiting the environmental contamination.

We recommend that the USGS and the BIA consider the current Environmental Protection Agency (EPA) proposed radiation and toxic metal standards for cleanup and disposal of uranium mill tailings sites. The Uranium Mill Tailings Radiation Control Act of 1978, amending the Atomic Energy Act of 1946 as amended in 1954, was established to upgrade control of radioactive emissions and contamination problems from nuclear related activities. The Nuclear Regulatory Commission (NRC) (Fed. Reg. Vol. 45 No. 194, October 3, 1980 p. 65521) promulgated final rules governing inactive and active uranium mill sites and tailings piles. This action was determined necessary in light of the current knowledge available that radioactive releases from these processes were more dangerous to public health than before recognized, and stricter monitoring of uranium mill activities was necessary to compel compliance with already existing regulations (Final Generic Environmental Impact Statement on Uranium Milling - NUREG -0706 Sept. 1980 - Three Volumes)

As a component of these new NRC regulations, the EPA was required to develop environmental and health standards for uranium mill tailings cleanup and disposal (Fed. Reg. Vol. 45, No. 79, April 22, 1980 p. 27371 and Fed. Reg. Vol. 46, No. 6, January 9, 1981, p. 2556, respectively). A Draft Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites (40 CFR 192) is available (EPA 520/4-80-011) as background information in determining the proposed standards.



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The proposed EPA standards, however, do not (at least as yet) apply to cleanup or disposal criteria for uranium mine wastes or tailings, but are limited to uranium mill tailings remedial action. However, since the same radionuclides and toxic metals exist in uranium mine waste piles as do in uranium mill tailings piles (with concentrations in mill piles of course greater), it would still seem appropriate to utilize the many years of research on the part of EPA technical staff in coming up with reasonable proposed standards for dealing with public health and environmental protection (ie. adequate protection and economically feasible) and apply these standards in the proposed reclamation of the Jackpile-Paguate stripmine area.

Since the open pit reclamation plan will be essentially the first of its kind, it necessarily will become a model for future reclamation plans of other such uranium mine sites. Therefore it is important to reclaim this area using the best known criteria for environmental and public health safeguarding for several thousand years.

There are specifically two proposed standards which we support and feel are critical and are discussed below:

Radon Daughters.

EPA has recommended that radon levels after disposal or stabilization of the waste pile be in the range of 0.5 to 2.0 pCi/m²-sec.* above background. Radon has been identified as one of the more dangerous radionuclides emitted from these waste piles in terms of known health effects (ie. lung cancer). The average uranium mill tailings pile ranges from an average of 25 pCi/m²-sec. from the wet portions, to 500 pCi/m²-sec. from the dry portion of the tailings pile. (Perkins, B. An Overview of the New Mexico Uranium Industry, NM Energy and Minerals Dept. 1/79 - estimates based on years 1977-1978). For a comparison, the estimated radon flux from various areas of the Jackpile mine are 1) waste piles were assumed to average a flux of 25 pCi/m²-sec.; 2) ore piles (estimated at 200 acres) 500 pCi/m²-sec.; 3) open pit areas (1200 acres), overburden and mine waste areas (1100 surface acres) 50 pCi/m²-sec. (Perkins, *ibid.*) The similar radon fluxes from uranium mine waste and mill waste warrants similar clean up and disposal criteria.

Based on uranium mill tailings piles estimates, the EPA estimates that about 200 premature deaths per century from radiation induced lung cancer (radon exposure), with 140 out of the 200 cancers expected in populations within 50 miles of inactive piles. (DEIS, EPA *ibid.*) In addition, new studies compiled by the National Institute of Occupational Safety and Health (NIOSH) (Study Group on The Risk of Lung Cancer Among Underground Miners of Uranium-Bearing Ores", 6/80) indicate that radon hazards may not be limited to lung cancer or respiratory disease alone, but may increase genetic damage in offspring of miners, affecting many future generations.

The population at Paguate is at special risk with regard to lung cancers and genetic damage as many people in the village were employed at the mine and the community is within a few miles to 1/2 mile away from the mine area. The EPA states that persons living one mile of a uranium mill tailings pile have a 200 times greater chance of fatal lung cancer as would those persons living 20 miles away. Genetic damage would be extremely severe for the populations of Paguate and Laguna for several reasons: 1) they are a relatively stable population and will continue to live in the area of the uranium piles for many generations to come; 2) Any genetic mutations suffered this population in addition to background radiation would increase substantially mutations found in this particular populations' gene pool; 3) the population is small and any mutations would not be "diluted" through larger populations by marriage outside the Pueblo area. This could alter the health and other developmental patterns of the entire Pueblo permanently.

Radium

Radium standards are proposed at approximately 5pCi/gm of soil to protect both groundwater from excessive contamination and also reduce radon flux (radium being the parent isotope of radon and its daughters. For reasons described in the preceding paragraphs, this is an important limit to set for radium concentrations, in addition to the fact that radium is extremely toxic when taken up by the body and its health risks (ie. radium dial painters) are well known. Since radium is treated like calcium by the body, it will metabolize in the bone which would present a particular risk to children of bone cancers, etc.

I will not go into detail on the other radiation standards proposed by EPA, except to state once again our recommendation that these proposed EPA standards as cited on page 1 be adopted as criteria in cleaning up and reclaiming the Jackpile mine area. Should consideration of these standards take place by the USGS and the BIA but are not adopted, we would like an explanation as to why these were not adopted after so much research has already been done indicating these standards will provide reasonable protection to the public and remain economically feasible. In addition, we also make the following recommendations:

1. A data base should be established for background radiation prior to the onset of uranium mining in that area for use in establishing what limits should not be exceeded above background radiation. This should include gamma and radon levels.

2. Plans should be made to assure the waterways contaminated above the limits now set for certain radionuclides and toxic metals be treated to remove these contaminants to substantially below current limits.

3. A dose assessment to the Paguate population should be developed to show the existing risk to persons living in this area, particularly Paguate, for over the last 20 years. This assessment should include various exposure possibilities:

- amount of radon daughters breathed
- amount of radioactive particles breathed
- direct gamma radiation exposure
- pathways which that particular population could be exposed through the food chain such as
 - drinking water
 - irrigation of crops
 - livestock utilizing surface water
 - livestock consumption
- concentration patterns of various radionuclides and toxic metals in vegetation consumed by livestock or local crops
- susceptibility to radiation of different segments of the population (ie. the old, young, fetus, child, male, female, those with other diseases, etc.)

Thank you for your attention to this comment. I would like to stress that my comments are based on what we believe to be a conservative basis for protecting the health of the people in the area. This population has been exposed to radiation levels far above background for the last 20 or so years, and as a result have already increased their risk of health disorders from this exposure. We should treat this population as one which is already sensitive to radiation and minimize to the extent possible any added risks through the following generations.

I look forward to receiving a copy of the Draft Environmental Impact Statement on the Jackpile mine reclamation plan for further comment.

Sincerely,
Lynda Taylor
Lynda Taylor

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